Water Trading: The New Water Allocation Mechanism in Victoria, Australia

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Abstract: This paper introduces the water trading framework in Victoria, Australia, mainly focusing on temporary water trading between farmers. It starts from the legal background of water allocation to the necessary conditions for a water market to form and operate. The study analyzes one of the very popular online water trading-WATERMOVE in Australia. The result from WATERMOVE is briefly discussed. The legal framework of water rights and the simple price formation mechanism are worth borrowing for water trading to prosper in our country.

Keywords: Water Allocation; Legislation; Water Trading; WATERMOVE; Water Price

1 Legislation Background

Legislative responsibility for water rests with the States and Territories who regulate and manage water use. While the Federal Government has no constitutional responsibility for water, it contributes to the development of broad polity and takes a strategic role in international and multi-State negotiations. Where there is a need for action by more than one State or Territory to deal with natural resource degradation, this can be co-ordinated through the Council of Australian Governments (COAG). The principal legislation relating to the allocation and management of water in Victoria is the Water Act 1989, with other acts, such as the Catchment and Land Protection Act 1994 and the Heritage Rivers Act 1992, also relevant. Under the Water Act 1989, it is the Water Authority's obligation to supply water to landholding.

2 Types of Water Rights in Victoria

Historically, the water was allocated by water rights, sales water and off-allocation to users. Water right is an extension of the idea of a 'right to water' and developed in Australia alongside the development of irrigation. Each farm in a public irrigation district was allocated a water right[1]. This water had to be paid for whether it was used or not. A right to water for irrigation was allocated to a property within an irrigation district that could be serviced by an irrigation channel or pipeline in an irrigation district. Thus the water right was tied to the land and it is the most secured water resources. Water rights vary within irrigation districts as well as between them, they were originally allocated with a view to allowing enough for a family to make a living. As a result, they are higher per hectare for small properties than for larger ones[2].

'Sales water' is water made available after the water rights have been met[3]. The amount allocated is proportional to the water right but irrigators are charged by volume for this water. The allocation of sales water is controlled largely by regulation, in Victoria it is the practice to allocate water for sale only after the supply of water to meet water right in the following year is assured.

'Off-allocation' is the access to rain-rejection, flood and other 'excess' flows in the river that is granted to downstream users in excess of their permanent water entitlement. Additional 'off-allocation' water may be declared for the Murray system in the spring of any year if there is water in the river in excess of South Australia's entitlement or that can be stored in Lake Victoria[1].

Provision of sales water is less secure than that of water rights and provision of off-allocation water is less secure still. Whereas, in the northern irrigation areas a quarter of the water used for irrigation in an average year is from these less-secure sources [4].

Prior to 1989 the right to allocations of water was, by and large, tied to ownership of land[1]. The Water Act 1989 removed common law rights to water and converted them to statutory rights. It established water authorities empowered to carry out functions under the Act in relation to floodplain management, irrigation, regional drainage, sewerage, waterway management and water supply. The Act defines primary entitlements, through licenses and rights, to water for consumptive uses, including stock, domestic and irrigated agriculture. It also introduced the bulk entitlements that are to be made to water authorities to meet these primary entitlements of water users served by the authorities and provides mechanisms for allocating water to meet these entitlements.

Licenses are the primary provision in the Water Act 1989 for control of diversions directly from waterways or aquifers. This provision applies to dams constructed

on waterways that are used for purpose other than stock and domestic supply. Access to water for stock and domestic use is allowed, as of right, to persons with land on which the waterway flows or to which it abuts, or on which a groundwater bore is located. Also these uses, under the Water Act, are recognized as having the highest priority claim on water.

Bulk entitlement is the water allocated to a water authority to meet its obligations of supplying water to its users. Though bulk entitlement can be applied to any source of water used by an authority, in practice, they usually apply to reservoirs and a few rivers from which water is pumped directly. The introduction of bulk entitlement is because, prior to the enactment of the Water Act 1989, entitlement to water was not precisely, nor clearly defined. The Water Act 1989 provides for conversion of former vague and imprecise rights authorities to water to more precisely defined entitlements.

By late 2000 about 80 per cent of the water diverted in Victoria each year was under bulk entitlements [5]. The first conversion to bulk entitlement took place for the Goulburn-Broken Rivers between 1992 and 1995[1], and was substantially copied for other conversions. It should be noted that where private diversion occur within an irrigation district, the water diverted under license is included in the bulk entitlement allocated to the water authority concerned[5].

The bulk entitlement (BE) conversion process is achieving its purpose of converting pre-existing, poorly defined entitlement of authorities to water to well-defined entitlements. Generally it does not, nor does it aim to, increase water for the environment.

3 Water Trading

In the Murray-Darling Basin, water taken for irrigation and other purpose had by the early 1990s climbed to equal 80% of natural flows at the mouth[5]. The limits to the water that can be harvested have clearly been reached in many catchments. The challenge now is not to build water supply dams and other infrastructure but to manage a finite resource in an environmentally sound, fair and productive way, the focus is on water savings and recycling and other demand management methods. As one of the efficient way to facilitate better allocation of existing water, trading is seen as a crucial tool.

3.1 Necessary Components of a Water Market

Efficient construction of any market requires the existence of the necessary conditions for trading to occur: (i) well-defined property rights; (ii) public information on the supply of and the demand for water rights; and (iii) the physical and legal possibility for trading to take place [6].

3.1.1 Property Rights

As indicated above, before 1989 water rights were tied to a specific parcel of land and could not be traded. As a result, as the limits of the water resource were reached, allocation of water to new land or to new uses was increasing restricted. Provisions in the Water Act 1989 for "transfer" of water allocated as bulk entitlement, water right, or under license, made trading of water possible, as they allowed water allocation to be moved from one land title to another. The Water Act 1989 allows water authorities to make by-laws that can restrict, or place conditions on, transfers, including where they could lead to an increase in use of water.

A feature of the water trading arrangements is that water is now an asset with a dollar value. Transfers may be within Victoria or, under certain conditions, interstate. In southease Australia, a pilot project launched in November 1997 allows permanent trade in water entitlement across state borders in the predominantly horticultural Mallee Region of the Murray Valley. Prior to this, water trading between states was a rare event and had only taken place on a temporary short-term basis[7]. Transfers may be temporary (less than a year) or permanent. Analysis of ten years water trading from 1990/1991 to 2000/2001 in Victoria, temporary transfers have a much higher percentage of total water use. Permanent transfer is nearly 1 per cent of the total volume of water rights and licenses, whereas temporary trading represents 3-8 per cent of total water use. Almost all the trading has been between farmers and other individual water users, and the great bulk of trade takes place in the regulated systems. High-return land owners buy permanent water rights in order to secure their irrigation water and the temporary market is due to the relative dry seasonal conditions[8].

As mentioned above, there are three important ways to access water: bulk entitlement from authorities, water rights attached to the properties and licenses. All of these three types of water can be transferred. A bulk entitlement held by a water authority may be traded, with the approval of the Minister, in whole or in part to another authority[9]. Within Victoria, the transfer can be temporary or permanent, interstate trading can only occur temporarily. While trading of water rights attached to a property, permission is required from the supplying authority of the seller and, in case of permanent transfers, the supplying authority of buyers. Water rights can be traded both within and interstate. Temporary or permanent trading of licenses from one property to another is permitted, both permanent and temporary transfer of a license can be into an irrigation district or to another states, if water is transferred into an irrigation district, it can be converted from a license to a water right.

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3.1.2 Information in a Water Market

As to the information, the publically available information on the supply of and the demand for water rights must include the means to identify willing buyers, sellers and intermediaries or brokers, and the means for entering into enforceable contracts. The North Victoria Water Exchange was set up in 1998 to facilitate and encourage temporary water trading through a transparent process that provides information on prices and volumes of water available for transfer. Through the exchange, trading can occur in:

- water rights in gravity- and pump-supplied irrigation districts;
- diversion licenses;
- supply by agreements; and
- sales and bulk entitlements.

Now a public water exchange business called "Watermove" is under construction, its aim is to establish a public water exchange covering the whole of Victoria, and it will also associate internet web site to announce the information. The objectives of the public water exchange include:

- providing a convenient and transparent brokerage system for the trade of water in all Victoria water markets within regulated water systems;
- establishing or expanding trading where it has not yet occurred or is underdeveloped;
- increasing the confidence of potential water traders in the market system through an open system that provides regular and comprehensive market information, disinterested pricing and fixed charges for the services provided [10].

3.1.3 Physical and Legal Arrangements

Besides the properly defined water rights and public information, the physical possibility of water trading is also very important. In Victoria, it has already shown that the capacity of pipes and channels to deliver water to farms or other region is a limit. For example, channels within the Murray Valley area around Cobram are heavily utilized, and this has been one reason why there has been relatively little trade within or into this area[8]. Barmah Choke is also a major constraint on flows and trade. All of these limitation lead to the delivery rights in water allocation. While differential pricing could assist in rationing limited delivery capacity in letting the users with the most urgent needs retain access. This measure can promote better use of infrastructure and temporarily delay enhancements by encouraging water users to take water at off-peak times. Also the extra revenue it generated could help with enhancements, when they became unavoidable.

Despite the incremental easing of restrictions over trade in water rights, the water market is essential thin. Transactions are almost confined within irrigation sector with little exception between rural and urban transfer. Legal constraints on tradability may protect local economies, but they also prevent water moving to its highest value use, and may compromise regional and even national water use efficiency[11].

3.1.4 Case Study: The Water Trading in Victoria-Watermove

As mentioned above, information is very important in water trading. Irrigators in Victoria concern about paucity of information about buyers, sellers, prices and other related information on water trading. Watermove, an internet information provider, make the trading easy and prosperous. Its role is to link up temporary sellers and buyers of water, and provide reliable market information.

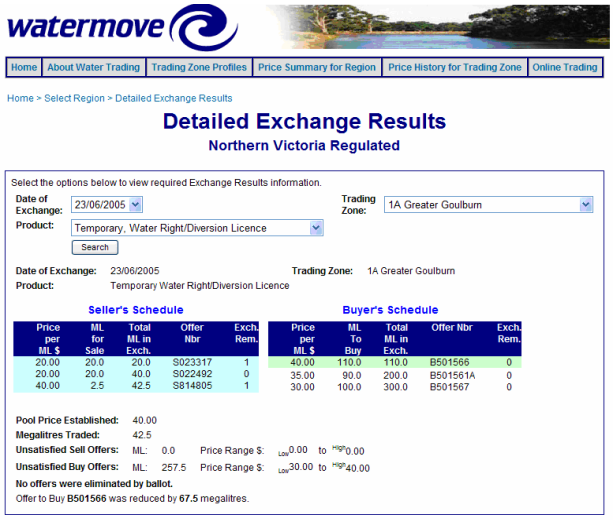

Figure 1. WATERMOVE trading detail

With WATERMOVE, the sellers will make an offer with certain amount of water to the Authority; and buyers will make a request to the Authority too. After getting these offers and bids, the sell offers are listed starting with the lowest asking price, together with the cumulative volume to be traded, and the buy bids are listed likewise, except starting with the highest bid price. After balancing the supply and demand, a price is determined, called pool price. It is the price halfway between the highest successful seller asking price and the lowest successful buyer bid price. In such a trading, sellers get what their asking price or more, and buyers pay what they were prepared to or less (see Figure 1).

WATERMOVE give a way for water trading like in a real market, especially it provides enough information for both buyers and sellers. Another advantage is to help water management authority easily control the trading information and registration. Now WATERMOVE proved very popular in Victoria and play an important role in water trading.

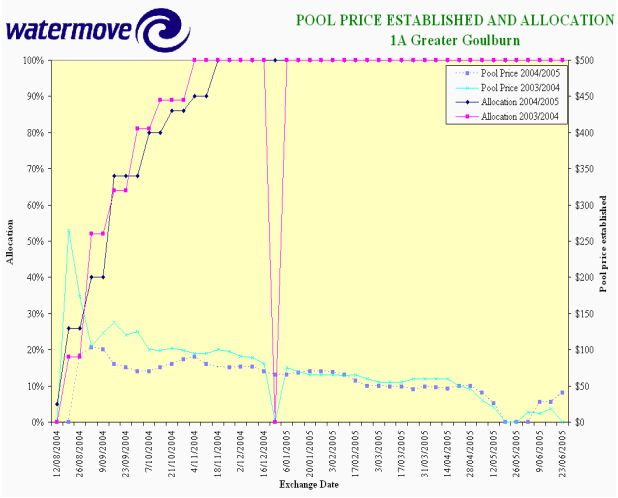

Figure 2. Pool price established through WATERMOVE and allocation

Just like the normal goods, price of water is influenced by supply and demand. However, due to the special characteristics of water, several other factors also influence the water price in practice. For supply and demand, the water allocation level and seasonal rainfall are main factors. The other factors like irrigation efficiency, plantings (e.g. annual plantings or perennial plantings), information availability and exchange, risk attitude, crop price and farm income etc, will also affect the price on market. Figure 2 shows the price vs allocation. However, in order to get detailed price information, several methods can be used. Firstly, if there is enough long term trading data, a regression analysis can help to find the relationship of price with various factors. Secondly, a physical-economic model can be built, considering the main factors in the model with economic theory. Thirdly, a survey can also help to identify buyers' willingness to pay and sellers' willingness to offer.

4 Summary and Discussion

Water trading has developed in Australia for several years. Although it is still not mature, water transfer in Victoria becomes more and more popular and plays an important role in allocating the scarce resources. It is essential in minimizing the social cost of water scarcity and policy reform. Irrigators use water markets to adjust their access to water both in the short-term between and within seasons and long term to manage the risks with associated with the fluctuations in annual water supply.

Water markets have been successful in achieving both policy objectives and social-economic objectives in Victoria and the Whole Australia; However, due to the short period the trade being through, better outcomes from water market could always be achieved by further provision of public information, infrastructure configuration.

In China, because water is owned by the state, it is not allowed to trade. However, due to the serious water shortages, conventional policies are inefficient in allocating the limited resource. Researchers in China have been working on the feasibilities of water market. However, there is no research done for a real market to operate. All of the work done was the general theories, which are very difficult to put into real world to operate. Victoria case gives us a good example. As a starting point, the Victorian experiences can be borrowed, including the types of water rights, initial allocation of water rights, water trading framework, market price determination etc.

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